

CLAIMS

1. A cooling system for a work machine, the cooling system comprising:

a cooling package comprising a heat exchanger unit and a cooling fan;

an upper cover disposed above the cooling package;

a side cover disposed at one side of the upper cover and facing the cooling package;

upper air intake holes that are formed in the upper cover so as to open to a space between the side cover and the cooling package;

side air intake holes formed in an upper part of the side cover, at a location adjacent to the upper cover; and

a sound insulating/flow regulating plate that is capable of: moving between the upper air intake holes and the side air intake holes; blocking sound generated inside the work machine; and regulating flows of air introduced from the upper air intake holes and the side air intake holes.

2. The cooling system for a work machine as claimed in claim 1, wherein:

the cooling system further comprises a swing shaft means disposed between the upper air intake holes and the side air intake holes; and

the sound insulating/flow regulating plate is swingably supported by the swing shaft means.

3. The cooling system for a work machine as claimed in claim 1, wherein the cooling system further comprises:

hinges for attaching a base edge of the sound insulating/flow regulating plate to an underside of the upper cover; and

a locking means for securing a distal edge of the sound insulating/flow regulating plate to the underside of the upper cover when the sound insulating/flow regulating plate is in a folded state.

4. The cooling system for a work machine as claimed in claim 1, wherein:

the cooling system further comprises a plurality of sound insulating/flow regulating plates.

5. The cooling system for a work machine as claimed in claim_1, wherein:

the side cover is a side door that can be opened outwards and back; and

the sound insulating/flow regulating plate is attached to the side door.

6. The cooling system for a work machine as claimed in claim 1, wherein the cooling system further comprises:

an actuator for operating the sound insulating/flow regulating plate;

temperature sensors for detecting temperature data of the cooling package; and

a control means for controlling an angle of the sound insulating/flow regulating plate by controlling the actuator based on temperature data from the temperature sensors.

7. The cooling system for a work machine as claimed in claim 1, wherein:

the heat exchanger unit of the cooling package comprises a plurality of devices selected from the group consisting of a heat exchanger of a radiator serving to cool cooling water for an engine, a heat exchanger of an oil cooler serving to cool hydraulic fluid in a hydraulic circuit, a condenser of an air conditioner circuit, and a heat exchanger of an aftercooler serving to cool engine intake air compressed by a turbo supercharger; and

the sound insulating/flow regulating plate is adapted so that a position of the sound insulating/flow regulating plate is adjustable to accommodate a combination structure of the selected devices and the cooling fan.

8. The cooling system for a work machine as claimed in claim 2, wherein the cooling system further comprises:

hinges for attaching a base edge of the sound insulating/flow regulating plate to an underside of the upper cover; and

a locking means for securing a distal edge of the sound insulating/flow regulating plate to the underside of the upper cover when the sound insulating/flow regulating plate is in a folded state.

9. The cooling system for a work machine as claimed in claim 2, wherein:

the cooling system further comprises a plurality of sound insulating/flow regulating plates.

10. The cooling system for a work machine as claimed in claim 3, wherein:

the cooling system further comprises a plurality of sound insulating/flow regulating plates.

11. The cooling system for a work machine as claimed in claim_2, wherein:

the side cover is a side door that can be opened outwards and back; and

the sound insulating/flow regulating plate is attached to the side door.

12. The cooling system for a work machine as claimed in claim 2, wherein the cooling system further comprises:

an actuator for operating the sound insulating/flow regulating plate;

temperature sensors for detecting temperatures of the cooling package; and

a control means for controlling an angle of the sound insulating/flow regulating plate by controlling the actuator based on temperature data from the temperature sensors.

13. The cooling system for a work machine as claimed in claim 3, wherein the cooling system further comprises:

an actuator for operating the sound insulating/flow regulating plate;

temperature sensors for detecting temperatures of the cooling package; and

a control means for controlling an angle of the sound insulating/flow regulating plate by controlling the actuator based on temperature data from the temperature sensors.

14. The cooling system for a work machine as claimed in claim 4, wherein the cooling system further comprises:

an actuator for operating the sound insulating/flow regulating plates;

temperature sensors for detecting temperatures of the cooling package; and

a control means for controlling angles of the sound insulating/flow regulating plates by controlling the actuator based on temperature data from the temperature sensors.

15. The cooling system for a work machine as claimed in claim 5, wherein the cooling system further comprises:

an actuator for operating the sound insulating/flow regulating plate;

temperature sensors for detecting temperatures of the cooling package; and

a control means for controlling an angle of the sound insulating/flow regulating plate by controlling the actuator based on temperature data from the temperature sensors.

16. The cooling system for a work machine as claimed in claim 2, wherein:

the heat exchanger unit of the cooling package comprises a plurality of devices selected from the group consisting of a heat exchanger of a radiator serving to cool cooling water for an engine, a heat exchanger of an oil cooler serving to cool hydraulic fluid in a hydraulic circuit, a condenser of an air conditioner circuit, and a heat exchanger of an aftercooler serving to cool engine intake air compressed by a turbo supercharger; and

the sound insulating/flow regulating plate is adapted so that a position of the sound insulating/flow regulating plate is adjustable to accommodate a combination structure of the selected devices and the cooling fan.

17. The cooling system for a work machine as claimed in claim 3, wherein:

the heat exchanger unit of the cooling package comprises a plurality of devices selected from the group consisting of a heat exchanger of a radiator serving to cool cooling water for an engine, a heat exchanger of an oil cooler serving to cool hydraulic fluid in a hydraulic circuit, a condenser of an air conditioner circuit, and a heat exchanger of an aftercooler serving to cool engine intake air compressed by a turbo supercharger; and

the sound insulating/flow regulating plate is adapted so that a position of the sound insulating/flow regulating plate is adjustable to accommodate a combination structure of the selected devices and the cooling fan.

18. The cooling system for a work machine as claimed in claim 4, wherein:

the heat exchanger unit of the cooling package comprises a plurality of devices selected from the group consisting of a heat exchanger of a radiator serving to cool cooling water for an engine, a heat exchanger of an oil cooler serving to cool hydraulic fluid in a hydraulic circuit, a condenser of an air conditioner circuit, and a heat exchanger of an aftercooler serving to cool engine intake air compressed by a turbo supercharger; and

the sound insulating/flow regulating plates are adapted so that positions of the sound insulating/flow

regulating plates are adjustable to accommodate a combination structure of the selected devices and the cooling fan.

19. The cooling system for a work machine as claimed in claim 5, wherein:

the heat exchanger unit of the cooling package comprises a plurality of devices selected from the group consisting of a heat exchanger of a radiator serving to cool cooling water for an engine, a heat exchanger of an oil cooler serving to cool hydraulic fluid in a hydraulic circuit, a condenser of an air conditioner circuit, and a heat exchanger of an aftercooler serving to cool engine intake air compressed by a turbo supercharger; and

the sound insulating/flow regulating plate is adapted so that a position of the sound insulating/flow regulating plate is adjustable to accommodate a combination structure of the selected devices and the cooling fan.

20. The cooling system for a work machine as claimed in claim 6, wherein:

the heat exchanger unit of the cooling package comprises a plurality of devices selected from the group consisting of a heat exchanger of a radiator serving to cool cooling water for an engine, a heat exchanger of an oil cooler serving to cool hydraulic fluid in a hydraulic circuit, a condenser of an air conditioner circuit, and a heat exchanger of an aftercooler serving to cool engine intake air compressed by a turbo supercharger; and

the sound insulating/flow regulating plate is adapted so that a position of the sound insulating/flow regulating

plate is adjustable to accommodate a combination structure of the selected devices and the cooling fan.